

## **REMARKS**

This is a response to the Office Action dated June 24, 2005.

### **Summary of Office Action**

The Office Action mailed June 24, 2005 was not initially received in full. In particular, pages 4 and 5 were missing. Pages 4 and 5 of the Office Action were received on August 8, 2005 via fax.

In the Office Action, the Examiner objected to the specification for various informalities. The Examiner also objected to the drawings as failing to comply with 37 C.F.R. § 1.84(p)(4) because reference character "32" has been used to refer to both a "receiver pad" (page 5, line 24) and "staggered blades" (page 5, line 25).

The Examiner provisionally rejected Claims 1-5 under 35 U.S.C. § 101 as claiming the same invention as that of Claims 7-11 of co-pending application Serial No. 10/849,683.

Claims 1-5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over McKague, Jr. et al (U.S. Patent No. 6,553,734; hereinafter the '734 patent) in view of McKague, Jr. et al (U.S. Patent No. 6,520,706; hereinafter the '706 patent).

### **Response to Office Action**

#### **Specification and Drawings**

In the Office Action, the Examiner objected to the disclosure based on various informalities. The Examiner also provided suggested changes to the disclosure to overcome such objection. As shown above in the amendments to the specification section, Applicant has amended the specification as suggested by the Examiner. Accordingly, Applicant respectfully submits that the Examiner's objection to the disclosure has been overcome.

The drawings were objected to based on a contention that reference character 32 was used to designate both a receiver pad and staggered blades. In response, instead of amending the drawing, Applicant has amended the specification such that referenced character 32 does not designate both a receiver pad and staggered blades. In particular, Applicant has amended the specification such that reference character 33 refers to staggered blades and reference

character 34 refers to a width of the staggered blade. Accordingly, Applicant respectfully submits that the Examiner's objections to the drawings have been overcome.

#### Double Patenting

Claims 1-5 were provisionally rejected under 35 U.S.C. § 101 as claiming the same invention as that of Claims 7-11 of co-pending application Serial No. 10/849,683. In response, as shown in Exhibit A, Applicant has cancelled Claims 7-11 of co-pending application Serial No. 10/849,683. Exhibit A is a response submitted in relation to application Serial No. 10/849,683. Accordingly, Applicant respectfully submits that such cancellation of Claims 7-11 of co-pending application Serial No. 10/849,683 overcomes the provisional rejection of Claims 1-5.

#### Claim Rejections - 35 U.S.C. § 103

Claims 1-5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the '734 patent in view of the '706 patent. In response, Applicant has amended Claim 1 to further recite a folding step and an unfolding step. In particular, in the folding step, a first portion is folded onto a second portion. After the first portion is stretched, the first portion is unfolded off of the second portion, and the first portion is formed into a curve without crumples. Applicant respectfully submits that the '734 patent and the '706 patent do not disclose the folding and unfolding steps.

In support thereof, Applicant respectfully directs the Examiner's attention to column 3, lines 31-35 of the '734 patent. Such referenced section of the '734 patent indicates that the preform is formed by the contours of the tool. As understood, once the preform is formed by the tool, it is not unfolded. Rather, the preform is ready to use out of the tool. Similarly, in the '706 patent, column 3, line 65 to column 4, line 1 indicates that the preform is heated and formed to the contours of a tool. As such, after the preform is formed to the contours of the tool, the preform is not unfolded. Rather, the preform is ready to use out of the tool. Hence, the '734 patent and the '706 patent do not disclose the steps of folding and unfolding as recited in amended Claim 1.

Moreover, there is no motivation to unfold the preform of the '734 patent and the '706 patent. In support thereof, Applicant respectfully directs the Examiner's attention to column 3, lines 56-58 of the '734 patent. Such referenced section recites that the curvatures of the preform imparts additional stiffness due to the out of plane geometry. If the curves of the preform of the '734 patent were unfolded (i.e., flattened), then there would be no out of plane geometry and no corresponding additional stiffness. This may make the preform of the '734 patent unsatisfactory for its intended purpose. Accordingly, even if a separate reference did disclose the unfolding step, there is no motivation to combine the unfolding step with the teachings of the '734 patent. Similarly, in the '706 patent, column 4, lines 11-13 indicates the same stiffening concept as disclosed in the '734 patent discussed above. Accordingly, there is no motivation to combine the unfolding step with the teachings of the '706 patent. Hence, Claim 1 is believed to be in condition for allowance. Claims 3, 4, 6 and 7 are also believed to be in condition for allowance for claiming additional patentable subject matter and for being dependent upon an allowable base Claim 1.

#### New Claims 8-13

By this Amendment, Applicant respectfully requests that new Claims 8-13 be entered into the prosecution of the above-identified patent application. Applicant respectfully submits that new Claim 8 is novel and non obvious in view of the cited prior art. New Claim 8 recites a stretching step and a shaping step wherein the preform is stretched with mating dies then the curved portion is shaped without crumples. Applicant respectfully submits that Claim 8 and Claims 9-13 are in condition for allowance for containing patentable subject matter. Claims 9-13 are also believed to be in condition for allowance for being dependent upon an allowable base Claim 8.

#### Cited Prior Art

Applicant acknowledges receipt of the prior art received and not relied upon, but considered by the Examiner to be pertinent to Applicant's disclosure. Applicant respectfully submits that the cited prior art, either alone or in combination, does not anticipate, suggest, or make obvious the instantly claimed invention.

Application No.: 10/779,901  
Response to Office Action of 06/24/2005  
Attorney Docket: NORTH-601A

**Conclusion**

For the foregoing reasons, Applicant respectfully submits that all of the stated grounds of rejection have been overcome, and that Claims 1, 3, 4, and 6-15 are in condition for allowance. An early Notice of Allowance is therefore respectfully requested.

Should the Examiner have any suggestions for expediting allowance of the application, the Examiner is invited to contact the Applicant's representative at the telephone number listed below.

If any additional fee is required, please charge Deposit Account Number 19-4330.

Respectfully submitted,

Date: August 12, 2005

By:



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Application No.: 10/849,683  
Response to Office Action of 06/24/2005  
Attorney Docket: NORTH-601B

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

|             |                                |   |                  |            |
|-------------|--------------------------------|---|------------------|------------|
| Applicants: | Carl Andrew Reis               | ) | Confirmation No. | 7546       |
|             |                                | ) |                  |            |
| Serial No.: | 10/849,683                     | ) | Art Unit:        | 1732       |
|             |                                | ) |                  |            |
| Filed:      | August 10, 2004                | ) | Examiner:        | Stefan     |
|             |                                | ) |                  | Staicovici |
| For:        | Process for Making a Curved PI | ) |                  |            |
|             | Shaped Preform Made from Woven | ) |                  |            |
|             | Composite Materials            | ) |                  |            |

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**RESPONSE TO OFFICE ACTION**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action of June 24, 2005, please amend the above-identified application as follows:

**Amendments to the Specification:**

Please amend paragraphs 27, 28, and 31 as follows:

[027] A completed preform 10A is shown in Figure 3, having a curved length 26, with a radius 28. To accomplish this, the upstanding legs 12 and 14 are pushed over onto the one of the bottom portions 16 or 17 as shown in Figure 14. The folded preform is then placed ~~place~~ in the die 30 shown in Figures 4 which includes a cutter head 31 and an receiver pad 32. The cutter head 31 incorporates staggered blades 33 ~~32~~ having a width 34 ~~33~~ as shown in Figure 4 ~~Figure-5~~ slightly greater than the width of the warp threads 20, allowing for some mismatch in warp thread location. This allows the warp threads 20 to be cut (darted) periodically into segments such that the cuts in each tread are spaced from the cuts in the adjacent treads as shown in Figures 6. The spacing 35 of the cuts should be as large a distance as possible, but still allowing the curved length 26 to be formed. Thus some experimentation may be required to obtain the optimum spacing.

[028] ~~Referring to Figures~~, if If the part is to be simply curved shape as shown in Figure 3, the darted preform 10 is folded as shown in Figure 14 Cactus with the legs 12 and 14 bent over on to leg 16. The preform 10 is placed in a sine-wave shaped die assembly 40 having matched die halves 41 and 42 with mating sign-wave shaped forming surfaces 43 and 44 respectively. The sign-wave pattern is on forming surface 43 is tapered from ends 45 and 46 on die half 41 and the forming surface 44 is tapered from ends 47 and 48 on forming surface 44. What the sine wave forming accomplishes is a stretching that is zero at the end of bottom portion 17 and a maximum at the end of bottom portion ~~petion~~ 16.

[031] If on the other hand, the preform final shape shown in Figure 12, and designated by numeral 10C, is desired, then, as illustrated in Figure 13, the legs 12 and 14, and portions 16 and 17 are brought together as in the previous example, and placed in the die assembly 40B having die halves 41B and 42B with forming surfaces 43B and 44B. However, stretching is accomplished by placing the folded preform 10 in the sine-wave dies such that stretching of the legs 12 and 14 is a minimum at there

ends and becomes a maximum at the center. Thereafter, stretching of the bottom portions 16 and 17 is held constant.

Please amend the abstract as follows:

~~(036)~~ The invention is a process for forming a preform for use in a structure having at least one curved portion of a specific length, including the steps of: 1) providing a preform having cable of expanding in length threads in rows parallel to the direction of curvature over a length equal to the length requiring curvature, such that the gaps between each thread row are spaced from the gaps in the adjacent tread rows; and ~~2~~ 2) stretching the portions of the preform requiring curvature in a sine-wave pattern.

**Amendments to the Claims:**

1. (Currently Amended) A process for forming a preform having a first portion and a second portion at an angle to the first portion, the first portion being curved, for use in a composite structure having at least one curved portion of a specific length, the process comprising the steps of:

folding the first portion onto the second portion;

providing a stretchable a-preform fabricated from bundled fibers for permitting the first portion to be curved without crumples; capable of expanding the length of the threads in rows parallel to the direction of curvature over a length equal to the length requiring curvature, and

stretching the first portion; portions of the preform requiring curvature in a sine wave pattern;

unfolding the first portion off of the second portion; and

forming the first portion into a curved without crumples.

2. (Original) The process as set forth in claim 1 wherein the preform is made of woven material.

3. (Currently Amended) The process as set forth in claim 2 wherein the step of providing an expandable a-preform capable of expanding the length of the threads in rows parallel to the direction of curvature over a length equal to the length requiring curvature includes the step of forming the preform with discontinuous threads. threads in rows parallel to the direction of curvature over length equal to the length requiring curvature, such that the gaps between each thread row are spaced from the gaps in the adjacent tread rows.

4. (cancelled)

5. (Currently Amended) The process as set forth in claim 1, ~~or 2, or 3, or 4,~~ wherein the ~~step of step of stretching the portions of the preform requiring curvature in a sine wave pattern includes forming~~ is accomplished in a sine wave shaped die.

6. (Currently Amended) The process of claim ~~5~~ 1 wherein the preform is a 3D woven PI shaped cross-section preform having first and second foot portions and first and second upstanding leg portions for use in a structure having at least one curved portion ~~of a specific leg.~~



7. (cancelled)
8. (cancelled)
9. (cancelled)
10. (cancelled)
11. (cancelled)
12. (new) The process of claim 3 wherein the discontinuous threads are in rows parallel to the direction of curvature over length equal to the length requiring curvature, such that the gaps between each thread row are spaced from the gaps in the adjacent thread rows.
13. (new) The process of Claim 5 wherein the sine wave shaped die is tapered.
14. (new) A process for forming a preform having a curved portion in a plane, the curved portion having a progressively increasing radius from a first edge to a second edge, the process comprising the steps of:
  - providing a stretchable preform fabricated from bundled fibers;
  - stretching the preform with mating dies for progressively expanding the preform from the first edge to the second edge; and
  - shaping the curved portion of the preform without crumples.
15. (new) The process of Claim 14 wherein the curved portion is a foot portion of the preform.
16. (new) The process of Claim 14 wherein the curved portion is a leg portion of the preform.
17. (new) The process of Claim 14 wherein the fibers of the bundled fibers are discontinuous.
18. (new) The process of Claim 14 wherein the mating dies define molding surfaces having a tapered sine wave configuration.
19. (new) The process of Claim 18 wherein the stretching step comprises the steps of:
  - disposing the preform between the mating tapered sine wave dies;
  - aligning the inner radius to a small amplitude end of the mating tapered sine wave dies;

aligning the outer radius to a large amplitude end of the mating tapered sine wave dies; and

closing the mating tapered sine wave dies onto the preform.

20. (new) The process of Claim 14 wherein the shaping step comprises the step of expanding the stretched preform about a die surface having a final desired shape of the preform.

**REMARKS**

This is a response to the Office Action dated June 24, 2005.

**Summary of Office Action**

In the Office Action, the Examiner withdrew the election requirement mailed May 13, 2005. Accordingly, Claims 1-11 are pending in the instant application.

The Examiner objected to the disclosure and the abstract due to various informalities. The Examiner also objected to the drawings as failing to comply with 37 C.F.R. 1.84(p)(4) because reference character 32 has been used to designate both a receiver pad and staggered blades.

Claims 7-11 were provisionally rejected under 35 U.S.C. § 101 as claiming the same invention as that of Claims 1-5 of co-pending application Serial No. 10/779,901. Claims 1-6 were provisionally rejected under the judicially created Doctrine of Obviousness-Type Double Patenting as being unpatentable over Claims 1-5 of co-pending application Serial No. 10/779,901.

Claims 1-5 were rejected under 35 U.S.C. § 102(a) as being anticipated by McKague, Jr. et al. (U.S. Patent No. 6,553,734; hereinafter '734 Patent). Claims 6-11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over McKague, Jr. et al (U.S. Patent No. 6,553,734 in view of McKague, Jr. et al (U.S. Patent No. 6,520,706).

**Response to Office Action**

**Specification and Drawings**

By this Amendment, Applicant has incorporated the suggestions provided by the Examiner in amending the Abstract and the disclosure of the above-identified application. Accordingly, the Examiner's objections to the Abstract and the disclosure are overcome by this Amendment.

Furthermore, Applicant has amended the specification such that referenced character 32 does not designate both a receiver pad and staggered blades. In particular, instead of amending the drawing, Applicant has amended the specification at page 6, lns. 25-26 such

that reference character 33 refers to staggered blades and reference character 34 refers to a width of the staggered blade. Accordingly, Applicant respectfully submits that the Examiner's objections to the drawings have been overcome.

#### Double Patenting

Applicant submits concurrently herewith a Terminal Disclaimer for co-pending application Serial No. 10/779,901, as Exhibit A. Accordingly, the provisional rejection of Claims 1-6 under the judicially created Doctrine of Obviousness-Type Double Patenting has been overcome.

#### Claim Rejections - 35 U.S.C. § 102

Claim 1 was rejected under 35 U.S.C. § 102(a) as being anticipated by the '734 patent. In response, Applicant has amended Claim 1 to further recite a folding step and an unfolding step. In particular, in the folding step, a first portion is folded onto a second portion. After the first portion is stretched, the first portion is unfolded off of the second portion, and the first portion is formed into a curve without crumples. Applicant respectfully submits that the '734 patent does not disclose the folding and unfolding steps.

In support thereof, Applicant respectfully directs the Examiner's attention to column 3, lines 31-35 of the '734 patent. Such referenced section of the '734 patent indicates that the preform is formed by the contours of the tool. As understood, once the preform is formed by the tool, it is not unfolded. Rather, the preform is ready to use out of the tool. Hence, the '734 patent does not disclose the steps of folding and unfolding as recited in amended Claim 1.

Moreover, there is no motivation to unfold the preform of the '734 patent. In support thereof, Applicant respectfully directs the Examiner's attention to column 3, lines 56-58 of the '734 patent. Such referenced section recites that the curvatures of the preform imparts additional stiffness due to the out of plane geometry. If the curves of the preform of the '734 patent were unfolded (i.e., flattened), then there would be no out of plane geometry and no corresponding additional stiffness. This may make the preform of the '734 patent unsatisfactory for its intended purpose. Accordingly, even if a separate reference did

disclose the unfolding step, there is no motivation to combine the unfolding step with the teachings of the '734 patent. Hence, Claim 1 is believed to be in condition for allowance. Claims 2, 3, 5 and 6 are also believed to be in condition for allowance for claiming additional patentable subject matter and for being dependent upon an allowable base Claim 1.

Claim Rejections - 35 U.S.C. § 103

By this Amendment, Applicant respectfully requests that Claims 6-11 be cancelled without prejudice.

New Claims 14-19

By this Amendment, Applicant respectfully requests that new Claims 14-19 be entered into the prosecution of the above-identified patent application. Applicant respectfully submits that new Claim 14 is novel and non obvious in view of the cited prior art. New Claim 14 recites a stretching step and a shaping step wherein the preform is stretched with mating dies then the curved portion is shaped without crumples. Applicant respectfully submits that Claim 14 and Claims 15-19 are in condition for allowance for containing patentable subject matter. Claims 15-19 are also believed to be in condition for allowance for being dependent upon an allowable base Claim 14.

Cited Prior Art

Applicant acknowledges receipt of the prior art made of record and not relied upon, but considered by the Examiner to be pertinent to Applicant's disclosure. Applicant respectfully submits that the cited prior art, either alone or in combination, does not anticipate, suggest, or make obvious the instantly claimed invention.

Conclusion

For the foregoing reasons, Applicant respectfully submits that all of the stated grounds of rejection have been overcome, and that Claims 1-3, 5, 6, and 12-20 are in condition for allowance. An early Notice of Allowance is therefore respectfully requested.

Application No.: 10/849,683  
Response to Office Action of 06/24/2005  
Attorney Docket: NORTH-601B

Should the Examiner have any suggestions for expediting allowance of the application, the Examiner is invited to contact the Applicant's representative at the telephone number listed below.

If any additional fee is required, please charge Deposit Account Number 19-4330.

Respectfully submitted,

Date: August 12, 2005

By:

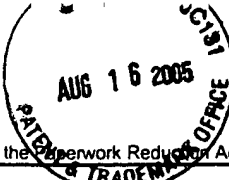


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**TERMINAL DISCLAIMER TO OBVIATE A PROVISIONAL DOUBLE PATENTING  
REJECTION OVER A PENDING SECOND APPLICATION**

Docket Number (Optional)

NORTH601B

In re Application of: Carl Andrew Reis

Application No.: 10/849,683

Filed: August 10, 2004

For: Process for Making a Curved PI Shaped Preform Made from Woven Composite Materials

The owner\*, Northrop Grumman Corp., of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application, which would extend beyond the expiration date of the full statutory term defined in 35 U.S.C. 154 to 156 and 173 as shortened by any terminal disclaimer filed prior to the grant of any patent granted on pending second Application Number 10/779,901, filed on 02/17/2004, of any patent on the pending second application. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the second application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. 154 to 156 and 173 of any patent granted on the second application, as shortened by any terminal disclaimer filed prior to the patent grant, in the event that any such granted patent: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

Check either box 1 or 2 below, if appropriate.

1. ☐ For submissions on behalf of an organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☒ The undersigned is an attorney or agent of record.

Signature

Date

Bruce B. Brunda, Reg. No. 28,497

Typed or printed name

- ☒ Terminal disclaimer fee under 37 CFR 1.20(d) is included.

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

\*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).  
Form PTO/SB/96 may be used for making this statement. See MPEP § 324.